

The comparison with Gordon is more uncertain, inasmuch as his observations were made on light of the refrangibility of the thallium line. The corrected* result for this light is in circular measure 1.5238×10^{-5} , or .05238 minute. To pass to sodium we may use a formula given by Becquerel† and Verdet according to which the rotation for different wave-lengths (λ) is proportional to $\mu^2(\mu^2 - 1)\lambda^{-2}$, μ being the refractive index. At this rate the .05238 minute for thallium would be .04163 minute for sodium. The temperature was not directly observed by Gordon, but was estimated to be about 13° C. Assuming this to be correct, the value for 18° would be .0413 minute, or about 2 per cent. *less* than according to my determinations.

XII. "Certain Points in connexion with the Physiology of Uric Acid." (Supplemental.) By ALFRED BARING GARROD, M.D., F.R.S. Received June 19, 1884.

(Abstract.)

One of the objects of the present paper is the correction of an error of interpretation in the author's communication of February 15th, 1883. Another object is to make known certain facts which he has ascertained in seeking to correct the same.

The author hopes, 1st, to give a true explanation of the phenomena previously misinterpreted; 2ndly, to make known some facts hitherto unknown, whence arose the error in question; and 3rdly, to show the existence of certain peculiarities in the urine of herbivorous mammals, with regard to uric acid, which peculiarities the author anticipated, so that he was led to undertake numerous experiments and observations with the object of verifying or disproving such anticipations.

The subject discussed in Part I is the influence of alkaline carbonates upon uric acid. Many experiments are detailed, and, as a result it is found that weak solutions of the alkaline carbonates, when exposed to the air, possess the power of decomposing uric acid in solution, and that oxalic acid and urea are among the products of the decomposition. By the recognition of this fact certain physiological phenomena in relation to the urine can be explained.

Part II is devoted to the demonstration of the action of glycocine (glycocoll) and a few other substances in protecting uric acid from

* Mr. Gordon's result was originally given at double its proper value.

† "Ann. d. Chim.," t. xii, 1877, p. 78.

decomposition when in an alkaline solution. Glycocine is shown to have a very considerable power, even when in small quantities, such as $\frac{1}{10}$ per cent. of the solution. It was this fact which led to the misinterpretation of certain phenomena in the author's paper of 1883; for it was found that in a glycocine solution no change of uric acid took place; whereas, in a solution of hippuric or benzoic acid, decomposition readily ensued; and, as the influence of weak alkaline carbonates was not then recognized, the destructive action was attributed to these acids.

It will be seen that, in a free state, glycocine protects uric acid, but when in union with benzoic acid (in the form of hippuric acid) its protective power is lost.

The different protective powers of glucose and cane-sugar are alluded to.

Part III treats of the urine of the herbivorous mammal under different conditions. It occurred to the author that, if at any time the urine of such animals should lose its ordinary alkaline state and become acid, at such time uric acid would probably be found.

Twenty-five specimens of urine derived from nine different horses were examined; besides which many other specimens, from ten different horses, were tested, simply to ascertain the reaction of the urine.

The tests employed to demonstrate the presence of uric acid are fully described under each examination, and some of the more important characters of the urine are given.

In eighteen different horses the urine was found to be acid in two only, and even in these two the acidity of the urine was by no means constant, as each of them passed, at times, an urine which was fully alkaline in reaction.

Many conclusions are drawn from the above observations, among which it is found that the character of the food does not necessarily influence the reaction of the urine; neither does the state of health; it is also found that almost all the urines had oxalate deposits; most of them contained an abundance of calcium carbonate, and all the urines examined were rich both in urea and in hippuric acid.

Of the results brought out, by far the most interesting is that which has regard to the presence or absence of uric acid; for it is shown that there is an absence of uric acid from the urine of the horse, when the reaction is alkaline, as it ordinarily is, but on the other hand, it is equally proved that, when the urine of the horse exhibits an acid reaction, then uric acid is present in quantities equal to what is found in the urine of carnivorous mammals, as the lion and the tiger.

It is also shown that the presence or absence of uric acid does not

depend on any peculiarity in the animal, but simply on the reaction of its urine at the time.

The original view of the author, which led to his making the numerous observations above mentioned, which also he enunciated in his communication of February, 1883, appears to be fully verified by them; and the conclusion may fairly be drawn that, under ordinary circumstances, the absence of uric acid from the urine of the adult horse is not due to the non-formation of this acid, but to the destruction which it undergoes when formed, so that, if at any time the destructive influence is removed by the fluid assuming an acid reaction, uric acid appears in the urine.

Lastly, we may derive from the above observations an explanation of the fact that uric acid is present in the urine of the suckling herbivorous mammal, for in such animals the urine is found to be acid in reaction.

XIII. "A Redetermination of the Atomic Weight of Cerium."

By HENRY ROBINSON, B.A., Assistant to the Professor of Chemistry in the University of Cambridge. Communicated by Professor LIVEING, F.R.S. Received June 11, 1884.

Having worked a good deal during the last few years on the preparation of pure compounds of the cerium and yttrium metals, I was led to seek some method by which I might obtain their anhydrous chlorides in such a state of purity that it would be possible to make from them redeterminations of the atomic weights of the metals. In April last year, I succeeded in preparing anhydrous cerium chloride (and in this paper I shall confine myself to that metal) by passing dry hydrochloric acid gas over what I may call air-dry cerium oxalate, heating it at first gently, so as not to char the oxalate, and then, as the operation proceeded, increasing the temperature to a full red heat. The chloride so obtained was perfectly white, and, when thrown into water, dissolved, with a hissing noise and a considerable evolution of heat, to a clear and colourless solution. I obtained the chloride so easily on the first attempt, I supposed I could repeat the experiment at will, but such did not prove to be the case, and, being much occupied with other duties, not much more was done towards the attainment of my object until the commencement of the present year. I had previously prepared a considerable quantity of pure cerium oxalate, in the following manner, from a crude yellow sulphate obtained from Schuchardt. It contained much didymium and